Low back pain (acute)

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ABSTRACT

INTRODUCTION: Low back pain (LBP) affects about 70% of people in resource-rich countries at some point. Acute low back pain is usually perceived as self-limiting; however, one year later, as many as 33% of people still have moderate-intensity pain and 15% have severe pain. It has a high recurrence rate; 75% of those with a first episode have a recurrence. Although acute episodes may resolve completely, they may also increase in severity and duration over time. METHODS AND OUTCOMES: We conducted a systematic review and aimed to answer the following clinical questions: What are the effects of oral drug treatments for low back pain? What are the effects of local injections for low back pain? What are the effects of non-drug treatments for low back pain? We searched: Medline, Embase, The Cochrane Library, and other important databases up to May 2007 (Clinical Evidence reviews are updated periodically, please check our website for the most up-to-date version of this review). We included harms alerts from relevant organisations such as the US Food and Drug Administration (FDA) and the UK Medicines and Healthcare products Regulatory Agency (MHRA). RESULTS: We found 34 systematic reviews, RCTs, or observational studies that met our inclusion criteria. We performed a GRADE evaluation of the quality of evidence for interventions. CONCLUSIONS: In this systematic review we present information relating to the effectiveness and safety of the following interventions: acupuncture, advice to stay active, analgesics (paracetamol, opioids), back exercises, back schools, bed rest, behavioural therapy, electromyographic biofeedback, epidural corticosteroid injections, lumbar supports, massage, multidisciplinary treatment programmes, muscle relaxants, non-steroidal anti-inflammatory drugs (NSAIDs), spinal manipulation (in the short term), temperature treatments (short wave diathermy, ultrasound, ice, heat), traction, and transcutaneous electrical nerve stimulation (TENS).

QUESTIONS

INTERVENTIONS

Key points

- Low back pain is pain, muscle tension, or stiffness, localised below the costal margin and above the inferior gluteal folds, with or without referred or radicular leg pain (sciatica), and is defined as acute when pain persists for less than 12 weeks.

  Low back pain affects about 70% of people in resource-rich countries at some point.

  Acute low back pain is usually self-limiting, although 2–7% develop chronic pain. Acute low back pain has a high recurrence rate with less-painful symptoms recurring in 50–80% of people within a year; one year later, as high as 33% still experience moderate-intensity pain and 15% experience severe pain.

- NSAIDs have been shown to effectively improve symptoms compared with placebo. However, their use is associated with gastrointestinal adverse effects.

Muscle relaxants may also reduce pain and improve overall clinical assessment, but are associated with some severe adverse effects including drowsiness, dizziness, and nausea.

The studies examining the effects of analgesics such as paracetamol or opioids were generally too small to detect any clinically important differences.

- We found no studies examining the effectiveness of epidural injections of corticosteroids in treating people with acute low back pain.
- With regard to non-drug treatments, advice to stay active (be it as a single treatment or in combination with other interventions such as back schools, a graded activity programme, or behavioural counselling) seems the most effective.

Spinal manipulation (in the short term) also seems to reduce pain, but not functional outcomes, compared with sham treatments.

We found insufficient evidence to judge the effectiveness of acupuncture, back schools, behavioural therapy, massage, multidisciplinary treatment programmes (for either acute or subacute low back pain), ortemperature treatments in treating people with acute low back pain.

We found no evidence examining the effectiveness of electromyographic biofeedback, lumbar supports, traction, or TENS in the treatment of acute low back pain.

Back exercises do not seem to increase recovery time compared with no treatment, although there is considerable heterogeneity among studies with regard to the definition of back exercise. There is also disparity among studies in the definition of generic and specific back exercise.

Bed rest does not improve symptoms any more effectively than other treatments, but does produce a number of adverse effects including joint stiffness, muscle wasting, loss of bone mineral density, pressure sores, and venous thromboembolism.

DEFINITION

Low back pain is pain, muscle tension, or stiffness, localised below the costal margin and above the inferior gluteal folds, with or without leg pain (sciatica), [1] and is defined as acute when pain persists for less than 12 weeks. [2] Non-specific low back pain is low back pain not attributed to a recognisable pathology (such as infection, tumour, osteoporosis, rheumatoid arthritis, fracture, or inflammation). [1] This review excludes acute low back pain with symptoms or signs at presentation that suggest a specific underlying pathoanatomical condition. People with solely sciatica (lumbosacral radicular syndrome) and/or herniated discs are also excluded. Unless otherwise stated, people included in this review have acute back pain (i.e. of less than 12 weeks' duration). Some included RCTs further subdivided acute low back pain of less than 12 weeks' duration into acute (less than 6 weeks' duration) or subacute (6–12 weeks' duration).

INCIDENCE/ PREVALENCE

Over 70% of people in resource-rich countries will experience low back pain at some time in their lives. [3] Each year, 15–45% of adults suffer low back pain, and 1/20 (5%) people present to a healthcare professional with a new episode. Low back pain is most common between the ages of 35–55 years. [3] About 30% of European workers reported that their work caused low back pain. Prevalence rates from different countries range from 13% to 44%. About 70% of people with sick leave due to low back pain return to work within 1 week, and 90% return within 2 months. However, the longer the period of sick leave, the less likely return to work becomes. Less than half of people with low back pain who have been off work for at least 6 months will return to work. [3] [4]

AETIOLOGY/ RISK FACTORS

Symptoms, pathology, and radiological appearances are poorly correlated. An anatomical source of pain cannot be identified in about 85% of people. About 4% of people with low back pain in primary care have compression fractures and about 1% have a tumour. [5] The prevalence of prolapsed intervertebral disc is about 1–3%. [3] Ankylosing spondylitis and spinal infections are less common. [5] Risk factors for the development of back pain include heavy physical work, frequent bending, twisting, lifting, and prolonged static postures. Psychosocial risk factors include anxiety, depression, and mental stress at work. [3] [6]

PROGNOSIS

Acute low back pain is usually self-limiting, although 2–7% develop chronic pain. Acute low back pain has a high recurrence rate with symptoms recurring, to a lesser degree, in 50–80% of people within a year; [7] one year later, as many as 33% still experience moderate-intensity pain and 15% experience severe pain.

AIMS OF INTERVENTION

To relieve pain; to improve function, to reduce time taken to return to work, to develop coping strategies for pain, with minimal adverse effects from treatment; and to prevent the development of chronic back pain (see definition in review on low back pain [chronic]). [2] [8]

OUTCOMES

Pain intensity (visual analogue or numerical rating scale); overall improvement (self-reported or observed); back pain-specific functional status (such as Roland Morris questionnaire, Oswestry

questionnaire); impact on employment (days of sick leave, number of people returned to work); medication use; intervention-specific outcomes (such as coping and pain behaviour for behavioural treatment, strength and flexibility for exercise, and muscle spasm for muscle relaxants and electromyographic biofeedback).

METHODS

Clinical Evidence search and appraisal May 2007. The following databases were used to identify studies for this review: Medline 1966 to May 2007, Embase 1980 to May 2007, and The Cochrane Database of Systematic Reviews and Cochrane Central Register of Controlled Clinical Trials 2007, Issue 2. Additional searches were carried out using these websites: NHS Centre for Reviews and Dissemination (CRD) — for Database of Abstracts of Reviews of Effects (DARE) and Health Technology Assessment (HTA), Turning Research into Practice (TRIP), and NICE. In addition, the contributors searched Medline (1966 to May 2007), Embase (1980 to May 2007), and Psychlit (1984 to May 2007), and The Cochrane Database of Systematic Reviews and Cochrane Central Register of Controlled Clinical Trials 2007, Issue 2, using the search strategy recommended by the Cochrane Back Review Group. [9] Most earlier RCTs of treatments for low back pain were small (fewer than 50 people/intervention group; range 9–169 people/intervention group), short term (mostly less than 6 months' follow-up), and of low overall quality. Problems included lack of power, no description of randomisation procedure, incomplete analysis with failure to account for people who withdrew from trials, and lack of blinding. [10] The quality of many recent RCTs is higher. Many early RCTs also had incomplete description of the study population (e.g. whether people had radiating symptoms or not, or the presence or absence of sciatica or nerve root symptoms). In this review, we have excluded studies done solely in people with sciatica or disc herniation. We have included studies in people with acute low back pain, in which the study does not describe whether people had radiation, or in which the study included people both with and without radiation. The contributors have also included data based on their own searches to May 2007 from the process of updating their own files. Abstracts of the studies retrieved from the initial search were assessed by an information specialist. Selected studies were then sent to the contributors for additional assessment, using predetermined criteria to identify relevant studies. Study design criteria for inclusion in this review were: published systematic reviews and RCTs in English language, at least single blinded, and containing more than 20 people, of whom more than 80% were followed up. There was no minimum length of follow-up required to include studies. We excluded all studies described as "open", "open label", or not blinded, unless blinding was impossible. In addition, we use a regular surveillance protocol to capture harms alerts from organisations such as the FDA and the UK Medicines and Healthcare products Regulatory Agency (MHRA), which are added to the review as required. To aid readability of the numerical data in our reviews, we round percentages to the nearest whole number. Readers should be aware of this when relating percentages to summary statistics such as RRs and ORs. We have performed a GRADE evaluation of the quality of evidence for interventions included in this review (see table, p 26).

QUESTION What are the effects of oral drug treatments for acute back pain?

OPTION MUSCLE RELAXANTS

Symptom improvement

Benzodiazepines compared with placebo Benzodiazepines may be more effective at reducing pain (very low-quality evidence).

Non-benzodiazepines compared with placebo Oral non-benzodiazepines (cyclobenzaprine, tizanidine, and orphenadrine) may be more effective at 2–4 days at reducing pain and at improving global assessment (low-quality evidence).

Compared with NSAIDs Muscle relaxants and NSAIDs seem equally effective at improving pain or overall improvement (moderate-quality evidence).

Muscle relaxants compared with each other We don't know how muscle relaxants compare with each other at reducing pain, improving daily activities, or in overall improvement (very low-quality evidence).

Functional improvement

Non-benzodiazepines compared with placebo Muscle relaxants may be no more effective at improving disability at 4 weeks (very low-quality evidence).

Adverse effects

Benzodiazepine and non-benzodiazepine muscle relaxants have been associated with adverse effects such as drowsiness, dizziness, and nausea.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

Benzodiazepines versus placebo:
We found one systematic review (search date 2001) [11] that identified one poor-quality RCT (68 people). [12] The RCT found that intramuscular diazepam followed by oral diazepam for 5 days significantly reduced pain and increased the rate of overall improvement (rating scales used to assess overall improvement not reported) compared with placebo (overall effect rated good or very good: 21/33 [64%] with diazepam *v* 6/35 [17%] with placebo; P value and pain results not reported in the review). However, treatment groups were not comparable at baseline.

Non-benzodiazepines versus placebo:
We found one systematic review (search date 2001) [11] and one subsequent RCT. [13] The review identified nine RCTs comparing non-benzodiazepines (tizanidine, cyclobenzaprine, carisoprodol, baclofen, orphenadrine) versus placebo. [11] Meta-analysis of RCTs with adequate data found that oral non-benzodiazepines (cyclobenzaprine, tizanidine, and orphenadrine) significantly reduced pain and improved global assessment after 2–4 days (presence of pain: 4 RCTs, 294 people; RR 0.80, 95% CI 0.71 to 0.89; global assessment at 2–4 days, dichotomous, assessed by patient: 4 RCTs, 222 people; RR 0.49, 95% CI 0.25 to 0.95). The subsequent RCT (192 people) compared chiropractic adjustments, muscle relaxants, and placebo, and found no significant difference among groups in disability at 4 weeks. [13] The RCT found a similar reduction in pain with muscle relaxants at 4 weeks compared with placebo (muscle relaxants *v* placebo; results presented graphically, P value not reported). [13]

Muscle relaxants versus each other:
We found one systematic review (search date 2001) [11] that identified three RCTs. [14] [15] [16] The RCTs found no clinically important differences in effect among muscle relaxants (cyclobenzaprine, carisoprodol, diazepam, and tizanidine), although the results were not pooled in the review. The first RCT (80 people) found that carisoprodol significantly increased overall improvement compared with diazepam, but found no significant difference in pain at 7 days (improvement rated as very good or excellent; 70% with carisoprodol *v* 45% with diazepam; pain on 100 mm visual analogue scale [VAS]: 58 mm with carisoprodol *v* 48 mm with diazepam; P values not reported in the review). [14] The second RCT (78 people) found no significant difference between carisoprodol and cyclobenzaprine in pain or overall improvement after 8 days (pain on 100 mm VAS: 30 mm with carisoprodol *v* 28 mm with cyclobenzaprine; overall improvement good or excellent: 70% with carisoprodol *v* 70% with cyclobenzaprine; P values not reported in review). [15] The third RCT (30 people with acute back pain, 20% with concomitant acute neck pain) was small and found no significant difference between diazepam and tizanidine in pain or function at 7 days (pain relief: 77.4% with tizanidine *v* 48.0% with diazepam; improvement in daily activities: 87% with tizanidine *v* 93% with diazepam; P values not reported in review). [16]

Harms:

The review found that muscle relaxants (both benzodiazepines and non-benzodiazepines) significantly increased adverse effects, particularly central nervous system effects, compared with placebo (all adverse effects, 8 RCTs, 724 people: RR 1.50, 95% CI 1.14 to 1.98; nervous system effects, 8 RCTs, 724 people: RR 2.04, 95% CI 1.23 to 3.37). [11] The most common adverse effects were drowsiness, dizziness, and nausea. The subsequent RCT gave no information on adverse effects. [13]

Comment:

None.

OPTION NSAIDS

Symptom improvement
Compared with placebo NSAIDs may be more effective at improving pain and global improvement at 7 days in people with low back pain and sciatica (very low-quality evidence).

Compared with each other We don't know how different NSAIDs compare with each other at improving pain (low-quality evidence).

Compared with opioid analgesics or paracetamol (acetaminophen) We don't know whether NSAIDs are more effective at reducing pain or symptoms (very low-quality evidence).

Compared with muscle relaxants NSAIDs and muscle relaxants seem equally effective at improving pain or overall improvement (moderate-quality evidence).

Compared with non-drug treatments We don't know whether NSAIDs are more effective than bed rest, physiotherapy, or spinal manipulation at improving pain (very low-quality evidence).

Compared with NSAIDs plus adjuvant treatment We don't know whether NSAIDs alone are more effective than combinations of NSAIDs with muscle relaxants or vitamin B at improving pain relief (very low-quality evidence).

NSAIDs (ibuprofen) compared with with heat wrap Ibuprofen may be less effective at improving pain at 1 and 4 days (low-quality evidence).

Functional improvement
Compared with each other We don't know whether nimesulide is more effective than ibuprofen at improving functional status at 10 days (low-quality evidence).

Compared with non-drug treatments We don't know whether NSAIDs are more effective than bed rest, physiotherapy, or spinal manipulation at improving disability scores or range of movement (very low-quality evidence).

NSAID (ibuprofen) compared with heat wrap Ibuprofen may be less effective at improving disability at 4 days (low-quality evidence).

Compared with specific back exercises We don't know whether NSAIDs are more effective at 3 months than McKenzie treatment at improving short-term disability (low-quality evidence).

Return to work
Compared with opioid analgesics or paracetamol (acetaminophen) We don't know whether NSAIDs are more effective at reducing the number of days to return to full activity (very low-quality evidence).

Compared with NSAIDs plus adjuvant treatment NSAIDs alone may be more effective than NSAIDs plus vitamin B combinations at increasing the proportion of people who return to work at 1 week (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

We found one systematic review (search date 1998, 45 RCTs, data pooled only for NSAIDs *v* placebo), [17] two additional RCTs, [18] [19] and four subsequent RCTs. [20] [21] [22] [23]

NSAIDs versus placebo:
We found one systematic review (search date 1998, 9 RCTs). [17] The review found that NSAIDs significantly increased the proportion of people experiencing global improvement after 1 week compared with placebo (global improvement; 6 RCTs, 535 people: OR 2.0, 95% CI 1.4 to 3.0). [17] However, the meta-analysis included a mixed population (some studies included people with only sciatica). Two RCTs identified by the review reported solely on acute low back pain without radiation. The first identified RCT (282 people) found that piroxicam significantly reduced pain after 3 days compared with placebo, but found no significant difference between groups at 7 days (further details not reported). The second identified RCT (73 people) found that tenoxicam significantly reduced mean pain intensity (measured using a visual analogue scale [VAS]) at 8 days compared with placebo (1.9 with tenoxicam *v* 2.8 with placebo; P value not reported). [17] One subsequent RCT (372 people) comparing diclofenac and ibuprofen versus placebo found that both active treatments significantly improved global efficacy at 7 days compared with placebo (5-point scale from 0 = poor to 4 = excellent: diclofenac *v* placebo; P less than 0.01; ibuprofen *v* placebo; P less than 0.05; absolute numbers not reported). [21] The RCT also compared diclofenac versus ibuprofen (see below).

NSAIDs versus each other:
We found one systematic review (search date 1998; 18 RCTs, 1982 people), [17] one additional RCT, [18] and four subsequent RCTs. [20] [21] [22] [23] The review found no difference among NSAIDs in outcomes (significance not assessed; P value not reported). [17] The additional RCT (194 people) found no significant difference in pain or global assessment between acemetacin and diclofenac (absolute numbers not provided; P value not reported). [18] One subsequent RCT (104 people) found that nimesulide improved functional status compared with ibuprofen, but found no significant difference in pain relief after 10 days (reported as not significant; P value not reported). [20] The second subsequent RCT (370 people) found no significant difference in global efficacy at 7 days between diclofenac and ibuprofen (P value not reported). [21] The third subsequent RCT (340 people with onset of acute low back pain 72 hours or less before enrollment) compared valdecoxib 40 mg once daily (with an additional dose of 40 mg on day 1) versus diclofenac 75 mg twice daily. [22] The RCT found no significant difference between valdecoxib and diclofenac in change in pain intensity (measured using VAS where 0 mm = no pain and 100 mm = worst pain) after 3 days' treatment (change from baseline after 3 days: –42.02 mm with valdecoxib *v* –41.43 mm with diclofenac; P = 0.908). The fourth subsequent RCT (220 people with acute low back pain and scoring at least 5 on an 11-point pain intensity rating scale [0 = no pain and 10 = unendurable pain]) compared lornoxicam (quick-release formulation; 24 mg on day 1 followed by 8 mg twice daily for 5 days) versus diclofenac (150 mg on day 1 followed by 50 mg twice daily for 5 days). [23] The RCT found a significant decrease in pain intensity after 1–6 days' treatment with lornoxicam compared with diclofenac (intention-to-treat analysis: measured as total of differences in pain intensities from baseline over time [higher score equates to larger decrease in pain] : 4.23 with lornoxicam *v* 3.78 with diclofenac; P = 0.0478).

NSAIDs versus analgesics (paracetamol, opioids):
See benefits of analgesics (paracetamol, opioids), p 7 .

NSAIDs versus muscle relaxants:
We found one systematic review (search date 1998, 5 RCTs, 399 people) that reported no significant difference in pain relief or overall improvement between NSAIDs and muscle relaxants (review did not pool data; significance not assessed; P value not reported). [17]

NSAIDs versus non-drug treatments:
We found one systematic review (search date 1998, 3 RCTs, 461 people). [17] Two included RCTs provided inconclusive evidence about effects of NSAIDs and bed rest. The first RCT (110 people) found that NSAIDs significantly improved combined score on pain, disability, and range of movement compared with bed rest (reported as significant; P value not reported). The second RCT (241 people) found no significant difference between treatments in range of movement, but did not examine effects on pain or function (reported as not significant; P value not reported). Two included RCTs (354 people) comparing NSAIDs versus physiotherapy or spinal manipulation found no significant difference between groups in pain relief or improvement in mobility (reported as not significant; P value not reported).

NSAIDs versus NSAIDs plus adjuvant treatment:
The review identified three RCTs (232 people) that found no significant difference in outcomes between NSAIDs alone and NSAIDs plus muscle relaxants (reported as not significant; P value not reported). [17] Two RCTs identified by the review found no significant difference in pain relief between NSAIDs and NSAIDs plus vitamin B (reported as not significant; P values not reported), although one of the RCTs found that NSAIDs plus vitamin B significantly increased the proportion of people returning to work after 1 week compared with NSAIDs alone (78% of people with combination treatment *v* 35% with NSAIDs alone; reported as significant; P value not reported).

NSAIDs versus heat wrap:
See benefits of temperature treatments, p 15 .

NSAIDs versus back exercises:
See benefits of back exercises, p 17 .

Harms:

NSAIDs may cause gastrointestinal complications (see review on NSAIDs).

NSAIDs versus placebo:
One systematic review of harms of NSAIDs found no significant difference in adverse effects between NSAIDs as a class and placebo (pooled OR for adverse effects *v* placebo 1.30, 95% CI 0.91 to 1.80). [24] The review reported that ibuprofen and diclofenac had the lowest gastrointestinal complication rate, mainly because of the low doses used in practice.

NSAIDs versus each other:
The review gave no information on adverse effects for this comparison. [17] The additional RCT found that a similar proportion of people reported adverse effects in the acemetacin and diclofenac groups (30/94 [32%] with acemetacin *v* 39/100 [39%] with diclofenac; significance not assessed; P value not reported). [18] No other information on adverse effects was reported.The subsequent RCT comparing nimesulide versus ibuprofen found similar rates of adverse effects in both groups (7/52 [13%] with nimesulide *v* 11/52 [21%] with ibuprofen; significance not assessed). The most common treatment-related side effects were gastrointestinal in nature. [20] One RCT found that similar proportions of people reported adverse effects in the diclofenac and ibuprofen groups (13% with diclofenac *v* 12% with ibuprofen; absolute numbers not reported; significance not assessed; P value not reported). [21] The subsequent RCT comparing valdecoxib versus diclofenac found similar rates of treatment-emergent adverse effects for the two treatments (48/170 [28%] with valdecoxib *v* 44/170 [26%] with diclofenac; between-group significance not assessed; P value not reported). [22] The RCT found no significant difference in the number of moderate or severe gastrointestinal adverse effects between valdecoxib and diclofenac, although there were fewer occurrences in the valdecoxib group (3/170 [2%] with valdecoxib *v* 8/170 [5%] with diclofenac; P = 0.219). The subsequent RCT comparing lornoxicam versus diclofenac found a similar proportion of people reporting adverse effects for the two groups (27/110 [25%] with lornoxicam *v* 28/110 [26%] with diclofenac; significance not assessed; P value not reported). [23] The most common minor adverse effects reported were abdominal pain and dizziness; no serious adverse effects were reported.

NSAIDs versus analgesics (paracetamol, opioids):
See harms of analgesics (paracetamol, opioids), p 7 .

NSAIDs versus muscle relaxants:
The review gave no information on adverse effects for this comparison. [17]

NSAIDs versus non-drug treatments:
The review gave no information on adverse effects for this comparison. [17]

NSAIDs versus NSAIDs plus adjuvant treatment:
The review gave no information on adverse effects for this comparison. [17]

NSAIDs versus heat wrap:
See harms of temperature treatments, p 15 .

NSAIDs versus back exercises:
See harms of back exercises, p 17 .

Comment: The systematic review of NSAIDs versus placebo has been withdrawn from the online version of the Cochrane Library because it is out of date (date of withdrawal February 2006), but it is still available in previous issues on CD. [17] Originally, COX-2 inhibitors, such as valdecoxib, were associated with fewer gastrointestinal adverse effects in osteoarthritic and rheumatoid arthritis studies; [25] however, they have been associated with serious cardiovascular adverse effects. Valdecoxib has been removed from the market in some countries because of concerns about its potential association with increased risk of heart attack and stroke. [26] Piroxicam is no longer recommended for the treatment of short-term painful and inflammatory conditions. Although piroxicam can still be used for the symptomatic relief of osteoarthritis, rheumatoid arthritis, and ankylosing spondylitis, it is not recommended as a first-line treatment for these conditions. Treatment should be used in the lowest dose (no more than 20 mg/day) and for the shortest duration possible. Piroxicam could be associated with a higher risk of gastrointestinal adverse effects and serious skin reactions compared with other non-selective NSAIDs.

OPTION ANALGESICS (PARACETAMOL, OPIOIDS)

Symptom improvement
Compared with NSAIDs We don't know whether opioid analgesics or paracetamol (acetaminophen) are more effective at reducing pain or symptoms (very low-quality evidence).

Compared with non-drug treatments We don't know whether paracetamol or analgesics (not specified) are more effective than electroacupuncture or ultrasound treatment at relieving pain (very low-quality evidence).

Analgesics alone compared with combination analgesics Paracetamol plus tramadol may be no more effective at 10 days than tramadol alone at reducing pain intensity, but may cause fewer adverse effects (very low-quality evidence).

Compared with heat wrap Paracetamol (acetaminophen) may be less effective at 1 and 4 days at improving pain (low-quality evidence).

Functional improvement
Compared with heat wrap Paracetamol (acetaminophen) may be less effective at improving disability at 4 days (low-quality evidence).

Return to work
Compared with NSAIDs We don't know whether opioid analgesics or paracetamol (acetaminophen) are more effective at reducing the number of days to return to full activity (very low-quality evidence).

Note
We found no direct information about whether analgesics (paracetamol, opioids) are better than no active treatment in people with acute low back pain.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found two systematic reviews (search date 1995; [10] search date 1998; [17] no statistical pooling of data provided in either review) and one subsequent RCT. [27]

Analgesics versus placebo:
The reviews identified no RCTs. [10] [17]

Analgesics versus NSAIDs:
The later review identified three small RCTs, none of which found a significant difference in clinical outcome between paracetamol (acetaminophen) or opioid analgesics and NSAIDs. [17] The first RCT (48 people) identified by the review found that, after 10 weeks, 54% of people taking paracetamol were symptom free compared with 67% taking ibuprofen (absolute numbers not reported; P value not reported). The second RCT (45 people) found that return to work was similar among treatments (mean number of days until return to full activity: 5.7 with paracetamol *v* 6.5 with phenylbutazone *v* 5.7 with aspirin; P value not reported). The third RCT (60 people) found that pain was similar among treatments (mean daily pain index measured on a 4-point ordinal scale: 1.7 with paracetamol *v* 1.4 with aspirin *v* 1.5 with indometacin [indomethacin] *v* 1.4 with mefenamic acid *v* 1.4 with phenylbutazone *v* 1.7 with dextropropoxyphene; P value not reported).

Analgesics versus non-drug treatments:
The earlier review identified one RCT (40 people) that found that electroacupuncture significantly reduced pain after 6 weeks compared with paracetamol (change in pain scores from baseline [on a 100-point VAS]: from 54.4 to 13.7 with paracetamol *v* from 52.7 to 3.3 with electroacupuncture; reported as significant; P value not reported). [10] The review identified a second RCT (73 people) that found that ultrasound treatment significantly increased the proportion of people who were pain free after 4 weeks compared with analgesics (unspecified) (41% with ultrasound *v* 7% with analgesics; reported as significant; P value not reported). [10]

Combination analgesics versus analgesic alone:
We found one RCT (119 people with non-specific low back pain of moderate intensity [40 mm or more on a 100 mm VAS] for 10–42 days before enrollment) that compared 10 days' treatment with paracetamol 325 mg plus tramadol 37.5 mg versus tramadol 50 mg alone. [27] The RCT found no significant difference between groups in change in pain intensity after 10 days' treatment (measured on a 100 mm VAS: from 67.5 mm to 27.9 mm with combination *v* from 65.3 mm to 24.8 mm with tramadol alone; P = 0.455).

Analgesic versus heat wrap:
See benefits of temperature treatments, p 15 .

Harms:

See paracetamol (acetaminophen) poisoning. RCTs have found adverse effects (constipation and drowsiness) with analgesics in about 50% of people. One earlier systematic review (search date 1995) found that combinations of paracetamol plus weak opioids increased the risk of adverse effects compared with paracetamol alone (15 single-dose studies; OR 1.1, 95% CI 0.8 to 1.5; 3 multiple-dose studies; OR 2.5, 95% CI 1.5 to 4.2).

Analgesics versus placebo:
The reviews identified no RCTs. [10] [17]

Analgesics versus NSAIDs:
The review gave no information on adverse effects for this comparison. [17]

Analgesics versus non-drug treatments:
The review gave no information on adverse effects for this comparison. [10]

Combination analgesics versus analgesic alone:
The RCT found that a significantly smaller proportion of people receiving combination treatment reported adverse effects compared with those receiving tramadol alone (30/59 [51%] with paracetamol plus tramadol *v* 44/60 [73%] with tramadol alone; P = 0.019). [27] The most common adverse effects reported were nausea, dizziness/vertigo, and sleepiness. The RCT found that the incidences of nausea and dizziness/vertigo were significantly lower in the combination group compared with the tramadol-alone group (nausea: 8/59 [14%] with combination *v* 21/60 [35%] with tramadol alone; P = 0.012; dizziness/vertigo: 3/59 [5%] with combination *v* 15/60 [25%] with tramadol alone; P = 0.006). However, there was no significant difference between groups in incidence of sleepiness (7/59 [12%] with combination *v* 15/60 [25%] with tramadol alone; P = 0.198).

Analgesic versus heat wrap:
See harms of temperature treatments, p 15 .

Comment:

The systematic review of NSAIDs versus placebo has been withdrawn from the online version of the Cochrane Library because it is out of date (date of withdrawal February 2006), but it is still available in previous issues on CD. [17]

QUESTION What are the effects of local injections for acute back pain?

OPTION EPIDURAL CORTICOSTEROID INJECTIONS

We found no clinically important results about the effects of epidural corticosteroid injections in people with acute low back pain. Epidural corticosteroid injections have been associated with serious adverse effects.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one systematic review (search date 1998) that identified no RCTs on the effects of epidural corticosteroid injections in people with acute low back pain without sciatica. [28]

Harms: We found no RCTs.

Comment: **Clinical guide:**
Epidural corticosteroid injections may be associated with serious adverse effects and should only be administered under specific indications. Epidural corticosteroid injections are only indicated for people with leg-dominant pain and root irritation. Epidurals are most effective for potential surgical candidates for whom surgery has been delayed; however, even in such cases, epidural injections lead to only marginal benefit. Epidurals give a short period of improvement and are ineffective in the long term. Epidural corticosteroid injections are not effective for those with only back pain.

QUESTION What are the effects of non-drug treatments for acute back pain?

OPTION ADVICE TO STAY ACTIVE

Symptom improvement
Compared with bed rest Advice to stay active is more effective at reducing pain at 3–12 weeks (moderate-quality evidence).

Functional improvement
Compared with no advice or traditional medical treatment (including analgesics as required, advice to rest, and "let pain be your guide") We don't know whether advice to stay active is more effective at reducing chronic disability (low-quality evidence).

Compared with bed rest Advice to stay active is more effective at improving functional outcomes at 3–12 weeks (moderate-quality evidence).

Return to work
Compared with no advice or traditional medical treatment (including analgesics as required, advice to rest, and "let pain be your guide") Advice to stay active may be more effective in the short term (3–12 months) at reducing sick leave in people with back pain and sciatica (very low-quality evidence).

Compared with bed rest We don't know whether advice to stay active is more effective at reducing sick leave at 12 weeks (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one systematic review (search date 1996, 6 RCTs, 1957 people), [29] and two subsequent RCTs reported in four papers. [30] [31] [32] [33]

Advice to stay active versus no advice or traditional medical treatment:
The review did not pool data, but reported consistent findings among included RCTs. [29] The review compared advice to stay active with or without other treatments versus those other treatments alone. The review found that advice to stay active significantly reduced sick leave (significance not assessed; reported as significant) and reduced chronic disability at up to 1 year compared with traditional medical treatment (including analgesics as required, advice to rest, and “let pain be your guide”) (see comment). [29] The first subsequent RCT (457 people, including 40% with a diagnosis of sciatica on their sickness certificate) found that advice to stay active significantly increased return to work compared with no advice (usual care) after 3, 6, and 12 months (AR at 3 months: 52% with advice *v* 36% with no advice; RR 1.45, 95% CI 1.17 to 1.79; at 6 months: 61% *v* 45%; RR 1.36, 95% CI 1.14 to 1.62; at 12 months: 68% *v* 56%; RR 1.21, 95% CI 1.05 to 1.40). [30] A longer-term follow-up report of this RCT found no significant difference between groups in the proportion of people who had returned to work at 2 or 3 years (number of people not returned to work at 2 years: 145/237 [61%] with advice *v* 144/220 [66%] with no advice; RR 0.93, 95% CI 0.81 to 1.06; number

of people not returned to work at 3 years: 150/237 [64%] with advice *v* 134/220 [61%] with no advice; RR 1.03, 95% CI 0.90 to 1.19). [31]

Advice to stay active versus bed rest:
See benefits of bed rest, p 22 .

Harms:

Advice to stay active versus no advice or traditional medical treatment:
The review [29] and subsequent RCTs [30] [31] [32] [33] gave no information on adverse effects.

Advice to stay active versus bed rest:
See harms of bed rest, p 22 .

Comment: Limitations in methods preclude meaningful quantification of effect sizes. Advice to stay active was provided either as a single treatment or in combination with other interventions such as back schools, a graded activity programme, or behavioural counselling.

OPTION MULTIDISCIPLINARY TREATMENT PROGRAMMES (ACUTE LOW BACK PAIN)

Symptom improvement
Compared with usual care We don't know whether graded activity is more effective at 26 weeks at reducing pain intensity (very low-quality evidence).

Functional improvement
Compared with usual care We don't know whether graded activity is more effective at improving functional status (very low-quality evidence).

Return to work
Compared with usual care People undergoing graded activity (even when combined with workplace intervention) may take longer to return to work (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one RCT assessing the effects of a multidisciplinary programme in people with acute low back pain analysed in two publications. [34] [35] The RCT (196 people with low back pain who had been on sick leave for 2–6 weeks) randomised people initially to a workplace intervention (96 people) or usual care (100 people). [34] At 8 weeks after the start of the person's sick leave, people (112 people) underwent a second round of randomisation to either graded activity or usual care. One report analysed the effects of the combination of graded activity plus workplace intervention (27 people) versus the effects of either treatment alone and usual care as a group (85 people): the study did not correct for the effects of the workplace intervention or graded activity in the control comparator group. [34] At 12 months, the study found no significant difference in the number of days off work (primary outcome) between groups receiving both the workplace intervention and graded activity compared with those receiving either treatment alone or usual care (median number of days off work: 143 with combined treatment *v* 126 without combined treatment; P = 0.49). The RCT also found no significant difference between groups in pain intensity and functional status (improvement in pain intensity [measured using a VAS, where 0 = no pain and 10 = severe pain]: 2.9 with combined treatment *v* 3.3 without combined treatment; improvement in functional status [measured using Roland Morris questionnaire]: 8.3 with combined treatment *v* 8.7 without combined treatment; number of people in analysis not reported; both comparisons reported as not significant; P values not reported). The second analysis of this study assessed the effects of graded activity versus usual care. [35] At 26 weeks, the RCT found that people in the graded activity group had a small, but significant, worsening in pain intensity compared with the usual-care group (mean improvement from baseline on a 10-point visual analogue scale [VAS]: 92 people analysed: 3.7 with graded activity *v* 3.2 with usual care; reported by the authors to be a significant difference in favour of usual care; P value not reported). [35] People undergoing graded activity took significantly longer to return to work compared with those receiving usual care (intention-to-treat analysis: median time taken to return to work: 139 days with graded activity *v* 111 days with usual care; HR 0.52, 95% CI 0.32 to 0.86; P less than 0.01). However, there was no significant difference between groups in functional status (mean improvement from baseline on Roland Morris questionnaire: 91 people analysed: 7.9 with graded activity *v* 7.5 with usual care; reported as not significant; P value not reported). The RCT reported that, of the 55 people assigned to graded activity, 27 received workplace intervention, and of the 57 assigned to usual care, 26 received the workplace intervention. Subgroup analysis of those who had not received workplace intervention (59 people) found no significant difference in median number of days taken to return to work between graded activity and usual care (HR 0.86, 95% CI 0.40 to 1.84; P = 0.69). The RCT did not carry out a subgroup analysis for those who received the workplace intervention. Graded activity comprised physiotherapist-supervised exercise programmes (26 sessions lasting 1 hour/week) emphasising return to work based on operent

conditioning principles. The workplace intervention consisted of ergonomic workplace assessment, modifications plus case management, and additional treatments (physiotherapy, manual therapy, Cesar therapy, and chiropractor care). The results presented should be interpreted with caution. The number of people who received both the workplace intervention and graded activity is unclear. Of the 55 people randomised to graded activity, 19 did not receive the clinical intervention, and, of the 36 people receiving graded activity, it is unclear how many had previously received the workplace intervention and were followed up for 12 months.

Harms: The RCT gave no information on adverse effects. [34] [35]

Comment: There was a considerable time lag between randomisation and the start of the graded activity programme, which, together with poor compliance in this group, could explain the observed delay in return to work. [35]

Clinical guide:
Multidisciplinary rehabilitation programmes are typically expensive and may not be necessary for uncomplicated acute low back problems. Multidisciplinary programmes are typically taken to comprise treatments provided by two or more health care providers with different professional training to obtain different perspectives and approaches to recovery. The term multidisciplinary does not imply a mandatory roster of specialists and does not dictate the nature of the treatment.

OPTION MULTIDISCIPLINARY TREATMENT PROGRAMMES (SUBACUTE LOW BACK PAIN)

Time to return to work
Compared with usual care Multidisciplinary treatment, including a workplace visit, may be more effective at reducing sick leave in people with subacute low back pain (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one systematic review (search date 2002, 2 RCTs, 233 people with subacute low back pain, duration between 4 weeks and 3 months). [36] The review found that multidisciplinary treatment, including a workplace visit, significantly reduced sick leave compared with usual care (time to return to work: 10 weeks with multidisciplinary treatment *v* 15 weeks with usual care in first RCT; RR for return to work rate 2.4, 95% CI 1.2 to 4.9 in second RCT). [36] However, both studies identified by the review were of low quality; methodological deficiencies included blinding of patients, therapists, and observers, reporting of co-interventions, and unclear reporting of loss to follow-up.

Harms: The review gave no information on adverse effects. [36]

Comment: The review included inpatient and outpatient programmes that were multidisciplinary. [36] To be multidisciplinary they had to consist of a physician's consultation plus either a psychological, social, or vocational intervention, or any combination. Trials in which rehabilitation was exclusively or predominantly medical were excluded, and back schools were also excluded from the review. [36] However, multidisciplinary programmes do not always include a psychosocial aspect.

Clinical guide:
Multidisciplinary rehabilitation programmes are typically expensive and may not be necessary for uncomplicated acute low back problems. Multidisciplinary programmes are typically taken to comprise treatments provided by two or more health care providers with different professional training to obtain different perspectives and approaches to recovery. The term multidisciplinary does not imply a mandatory roster of specialists and does not dictate the nature of the treatment.

OPTION SPINAL MANIPULATION

Symptom improvement
Compared with placebo or sham treatment Spinal manipulation and chiropractic adjustment may be more effective in the short term (less than 6 weeks) at reducing pain (low-quality evidence).

Functional improvement
Compared with placebo or sham treatment Spinal manipulation and chiropractic adjustment may be no more effective at improving disability in either the short or long term (low-quality evidence).

Compared with specific back exercise Spinal manipulation may be less likely than McKenzie treatment to increase disability at 5 days and at 4 weeks (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one systematic review (search date 2000, 39 RCTs) [37] and one subsequent RCT. [13]

Spinal manipulation versus placebo or sham treatment:
The review found that spinal manipulative therapy significantly reduced pain in the short term (less than 6 weeks) compared with sham therapy, but found no significant difference in the longer term (short-term difference in pain on 100 mm VAS: 10 mm, 95% CI 2 mm to 17 mm). [37] The review found no significant difference in either short- or long-term disability between groups (difference in disability on Roland Disability questionnaire: short term: +2.8 mm, 95% CI –0.1 mm to +5.6 mm; long term: further data not reported). The subsequent RCT (192 people) compared chiropractic adjustments, muscle relaxants, and placebo, and found no significant difference in disability at 4 weeks among groups. [13] The RCT found that chiropractic adjustment significantly reduced pain compared with placebo (sham treatment) at 2 weeks and 4 weeks (both comparisons, P = 0.03). [13]

Spinal manipulation versus other treatments:
The review found no significant difference in pain or function between spinal manipulative therapy and general-practitioner care, physiotherapy, exercises, or back school (results presented graphically). [37]

Spinal manipulation versus back exercises:
See benefits of back exercises, p 17 .

Harms: **Spinal manipulation versus placebo or sham treatment:**
The systematic review gave no information on adverse effects. [37] A second systematic review assessed harms of spinal manipulation. [38] In RCTs identified by the review that used a trained therapist to select people and perform spinal manipulation, the risk of serious complications was low, with an estimated risk of vertebrobasilar strokes of 1/20,000–1/1,000,000 people and risk of cauda equina syndrome of less than 1/1,000,000 manipulations. [39] The subsequent RCT gave no information on adverse effects. [13]

Spinal manipulation versus other treatments:
The review gave no information on adverse effects. [37]

Spinal manipulation versus back exercises:
See harms of back exercises, p 17 .

Comment: Current guidelines do not advise spinal manipulation in people with severe or progressive neurological deficit. [2] [40] The review included RCTs that compared manipulation or mobilisation for low back pain with another treatment or control (the review noted that manipulation differed from mobilisation in that manipulation focused on a different range of motion of the involved joint — the review reported that both hands-on treatments were included in the review. [37]

OPTION ACUPUNCTURE

Symptom improvement
Compared with sham needling or other treatments We don't know whether acupuncture is more effective at reducing pain (very low-quality evidence).

Functional improvement
Compared with sham needling or other treatments We don't know whether acupuncture is more effective at improving functional status (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one systematic review (search date 2003; see comment) that found three RCTs of acupuncture in people with acute low back pain. [41] The review did not pool data. The first included RCT (40 people) found no significant difference in pain or function (measured immediately after the session) between one session of acupuncture on the SI3 acupoint bilaterally, and sham needling of the same point (see comment). The second included RCT (60 people) found no significant difference in pain between acupuncture and naproxen. The third identified RCT (100 people with low back pain, 5 days to 6 months duration, worse in cold or rainy weather), which was of poor methodological quality, comparing acupuncture plus moxibustion (burning a herb at the end of the needle) plus Chinese herbal medicine versus Chinese herbal medicine alone, making it difficult to draw reliable conclusions on the effects of acupuncture alone.

Harms: One systematic review (search date 1996) found that serious, rare, adverse effects included infections (HIV, hepatitis, bacterial endocarditis) and visceral trauma (pneumothorax, cardiac tamponade). [42]

Comment: The first included RCT was reported only in abstract form. The authors of the systematic review obtained additional material from the authors of the RCT. [41] The review concluded that, because of the small sample sizes and low methodological quality of the studies, the data did not allow firm conclusions about the effectiveness of acupuncture in acute low back pain. [41] Many studies of acupuncture identified by the search were either non-English language papers (which we excluded) or were published in difficult-to-access journals and, thus, were not available for update of this intervention.

OPTION BACK SCHOOLS

Symptom improvement
Compared with placebo or usual care We don't know whether back schools are more effective at improving pain (very low-quality evidence).

Functional improvement
Back schools plus usual treatment compared with usual treatment alone Back schools plus usual treatment may be no more effective at improving functional status (very low-quality evidence).

Return to work
Compared with placebo or usual care We don't know whether back schools are more effective at reducing sick leave (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found one systematic review (search date 2003, 4 RCTs, see comment below). [43] The review did not pool data owing to data deficiencies and heterogeneity of trial design. The systematic review assessed the quality of included RCTs against standard criteria and categorised them as being of higher or lower methodological quality (high quality: score of 6 or more on a methodological scale of 0–10). One low-quality RCT (217 people working in a car factory, pain with or without radiation; see comment) identified by the review compared back school, combined physiotherapy (including manual therapy), and placebo (short waves at the lowest intensity). The review found that back school significantly reduced the duration of sick leave compared with placebo (mean days until recovery: 14.8 with back school *v* 28.7 with placebo; median days of absence from work: 20.5 *v* 26.5; P value not reported), but found no significant difference between groups in pain at 6 weeks or recurrences during 1 year (P values not reported). A second high-quality RCT (170 people attending a private outpatient clinic, reporting inability to work and receiving compensation) identified by the review compared back school plus usual treatment versus usual treatment alone (including rest, analgesics, NSAIDs as appropriate, daily physiotherapy) and measured outcomes at 8 weeks, 6 months, and 12 months. The review found no significant differences between groups in pain, functional status, median time to return to work, or compensated recurrences over 1 year. A third low-quality RCT (56 people attending a general practitioner, in pain with or without radiation to the thigh; see comment) identified by the review compared back school versus a control treatment (advice not to strain the back, analgesics when required). The review found no significant difference between groups in the proportion of people pain free at 1, 3, or 6 weeks. The fourth high-quality RCT (975 people referred to a spine clinic, on sick leave from work for 8–12 weeks, in pain with or without radiation; see comment) identified by the review compared back school versus usual care. The review found that back school significantly reduced sick leave compared with usual care at 200 days and 5 years (200 days: 30% with back school *v* 60% with usual care; 5 years: 19% *v* 34%; P values not reported).

Harms: The review gave no information on adverse effects. [43]

Comment: The systematic review included RCTs in which a back-school type intervention was included. A back school was defined as consisting of an educational and skills-acquisition programme, including exercises, in which all lessons were given to groups of people and supervised by a paramedical therapist or medical specialist. [43] The back-school programmes in the four included RCTs varied considerably between trials, as did the included populations, making generalisations difficult. Three RCTs included people with radiating back pain (not further defined), but subgroup analysis of back pain without radiation was not possible. [43] With the explosion in the ways in which information can be disseminated, formal back schools have become far less common than previously. The emphasis currently focuses more on general education, often through less-traditional methods such as the Internet. In a future update, we will include education on low back pain as a separate intervention.

OPTION BEHAVIOURAL THERAPY

Symptom improvement
CBT compared with usual care We don't know whether CBT is more effective than traditional care (analgesics plus back exercises until pain subsides) at reducing low back pain at 9–12 months (very low-quality evidence).

CBT plus generic back exercise compared with no exercise or CBT alone CBT plus neuromuscular training may be more effective at reducing pain intensity at 7 days (low-quality evidence).

Functional improvement
CBT compared with usual care We don't know whether CBT is more effective than traditional care (analgesics plus back exercises until pain subsides) at improving perceived disability at 9–12 months (very low-quality evidence).

CBT plus generic back exercise compared with no exercise or CBT alone CBT plus neuromuscular training may be no more effective at improving disability at 12 months (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

CBT versus usual care:
We found one systematic review (search date 1995, 1 RCT, 107 people). [10] The poor-quality RCT identified by the review found that CBT significantly reduced pain and perceived disability compared with traditional care (analgesics plus back exercises until pain had subsided) at 9–12 months' follow-up (mean score on pain drawing: 1.98 with CBT *v* 3.06 with control; mean claimed impairment: 4.84 *v* 6.25; scales not defined, P values not reported). [10]

CBT plus back exercise versus no exercise or versus CBT:
See benefits of back exercises, p 17 .

Harms:

CBT versus usual care:
The review did not report on harms. [10]

CBT plus back exercise versus no exercise or versus CBT:
See harms of back exercises, p 17 .

Comment: None.

OPTION ELECTROMYOGRAPHIC BIOFEEDBACK

We found no direct information about the effects of electromyographic biofeedback in people with acute low back pain.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found no systematic reviews or RCTs of electromyographic biofeedback in people with acute low back pain.

Harms: We found no evidence on harms.

Comment: None.

OPTION LUMBAR SUPPORTS

We found no direct information about the effects of lumbar supports in people with acute low back pain.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found no systematic review or RCTs specifically in people with acute low back pain.

Harms: Harms associated with prolonged lumbar support use include decreased strength of the trunk musculature, a false sense of security, heat, skin irritation, and general discomfort. [2]

Comment: None.

OPTION MASSAGE

Symptom improvement

Compared with spinal manipulation or electrical stimulation We don't know whether massage is more effective at relieving pain (low-quality evidence).

Specific back exercise compared with passive treatments A combined analysis of educational booklets, bed rest, ice packs, and massage may be less effective at 7 days than McKenzie treatment at reducing pain (low-quality evidence).

Functional improvement
Compared with spinal manipulation or electrical stimulation We don't know whether massage is more effective at improving functional status or mobility (low-quality evidence).

Specific back exercise compared with passive treatments A combined analysis of educational booklets, bed rest, ice packs, and massage may be less effective than McKenzie treatment at 7 days but not at 4 weeks at reducing disability (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

Massage versus spinal manipulation or electrical stimulation:
We found one systematic review (search date 2001, 1 RCT). [44] The review identified one RCT (90 people) comparing massage versus spinal manipulation or electrical stimulation and found no significant difference in pain relief, functional status, or mobility. [44]

Massage versus back exercises:
See benefits of back exercises, p 17 .

Harms:

Massage versus spinal manipulation or electrical stimulation:
The review gave no information on adverse effects. [44]

Massage versus back exercises:
See harms of back exercises, p 17 .

Comment:

The review defined massage as soft tissue manipulation using the hands or a mechanical device (examples include Shiatsu, Rolfing [soft tissue manipulation], Swedish massage, reflexology, craniosacral therapy, as part of physiotherapy). [44] Massage could be applied to any body part (lumbar region only or to the whole body) and any technique could be used (e.g. cyriax, friction, kneading, and hacking).

OPTION TEMPERATURE TREATMENTS (SHORT-WAVE DIATHERMY, ULTRASOUND, ICE, AND HEAT)

Symptom improvement
Heat wrap compared with placebo or non-heated wrap Heat wrap is more effective at improving pain relief at 5 days (moderate-quality evidence).

Heat wrap compared with oral analgesic Heat wraps may be more effective than paracetamol [acetaminophen] at improving pain at 1 and 4 days (low-quality evidence).

Heat wrap compared with NSAID (ibuprofen) Heat wraps may be more effective at improving pain at 1 and 4 days (low-quality evidence).

Heat wrap plus education compared with education alone Heat wrap plus education may be more effective at reducing pain intensity but not pain relief at 14 days (low-quality evidence).

Heat wrap alone compared with McKenzie treatment We don't know whether heat wrap is more effective at relieving pain at 2–7 days (low-quality evidence).

Functional improvement
Heat wrap compared with placebo or non-heated wrap Heat wrap is more effective at improving disability at 5 days (moderate-quality evidence).

Heat wrap compared with oral analgesic Heat wraps may be more effective than paracetamol [acetaminophen] at improving disability at 4 days (low-quality evidence).

Heat wrap compared with NSAID (ibuprofen) Heat wraps may be more effective at improving disability at 4 days (low-quality evidence).

Heat wrap plus education compared with education alone Heat wrap plus education may be more effective at improving disability at 14 days (low-quality evidence).

Heat wrap alone compared with McKenzie treatment We don't know whether heat wrap is more effective at improving function at 2–7 days (low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

We found one systematic review (search date 2005, 5 RCTs, 856 people with acute or subacute low back pain) [45] and one subsequent RCT [46] assessing the effects of heat treatments on low back pain. The review reported that only a small proportion of the data were suitable for pooling (pooling was not possible for most outcomes and comparisons). We found no review or RCTs on the effects of short-wave diathermy, ultrasound, or cold therapies in people with acute low back pain.

Heat wrap versus placebo or non-heated wrap:
The review found that heat wrap therapy significantly improved pain relief, reduced pain, and improved disability at 5 days compared with placebo or non-heated wrap (pain relief [scale range 0–5, higher score favours heat]: 2 RCTs, 258 people: WMD 1.06, 95% CI 0.68 to 1.45; pain [measured using a visual analogue scale with a scale range from 0 to 100, lower score favours heat]: 1 RCT, 90 people: WMD –32.20, 95% CI –38.69 to –25.71; disability [measured using Roland Morris questionnaire, lower score favours heat]: 2 RCTs, 258 people: WMD –2.12, 95% CI –3.07 to –1.18). [45]

Heat wrap versus paracetamol (acetaminophen):
The review found that heat wrap significantly improved pain relief at both 1 and 4 days' treatment, and improved disability at 4 days' treatment compared with acetaminophen (1 RCT, 226 people: pain relief at 1 day: WMD 0.90, 95% CI 0.50 to 1.30; pain relief at 4 days: WMD 0.74, 95% CI 0.31 to 1.17; disability at 4 days: WMD 2.00, 95% CI 0.86 to 3.14). [45]

Heat wrap versus NSAID (ibuprofen):
The review found that heat wrap significantly improved pain relief at both 1 and 4 days' treatment and improved disability at 4 days' treatment compared with ibuprofen (1 RCT, 226 people: pain relief at 1 day: WMD 0.65, 95% CI 0.25 to 1.05; pain relief at 4 days: WMD 1.05, 95% CI 0.62 to 1.48; disability at 4 days: WMD 2.20, 95% CI 1.11 to 3.29). [45]

Heat wrap plus education versus education alone:
The subsequent RCT (43 people with acute low back pain) compared topical heat wrap (worn during daytime hours for 3 consecutive days) plus education versus education alone. [46] At 14 days after initial treatment, the RCT found that combined treatment of heat wrap plus education significantly reduced pain intensity and significantly improved disability compared with education alone (difference between groups adjusted for sex, age, baseline pain intensity, and pain medication usage: pain intensity: –1.75, 95% CI –3.33 to –0.18; P = 0.030: disability: –4.33, 95% CI –8.41 to –0.27; P = 0.038). The RCT found that heat wrap plus education significantly increased pain relief at 4 days compared with education alone, but the difference between groups was not significant at 14 days (difference between groups adjusted for sex, age, baseline pain intensity, and pain medication usage: 4 days: 1.13, 95% CI 0.11 to 2.14, P = 0.03: 14 days: +0.80, 95% CI –0.33 to +1.93; P = 0.157). Pain intensity was measured as a change in a visual analogue scale (VAS [where 0 = no pain and 10 = pain as bad as it could be]) and disability was measured using the Roland Morris questionnaire. Education comprised distribution of written material describing low back pain covering, for example, the recognition and treatment of symptoms.

Heat wrap alone versus McKenzie treatment:
The review found no significant difference between heat wrap and McKenzie treatment in pain relief or function at 2 or 7 days' follow-up (1 RCT, 50 people: pain relief [higher score favours heat]: 2 days: 1.40 with heat wrap *v* 1.00 with McKenzie treatment; WMD +0.40, 95% CI –0.15 to +0.95; 7 days: 2.30 with heat wrap *v* 2.00 with McKenzie treatment; WMD +0.30, 95% CI –0.68 to +1.28; function: 2 days: –0.90 with heat wrap *v* –0.20 with McKenzie treatment; WMD –0.70, 95% CI –2.09 to +0.69; 7 days: –2.80 with heat wrap *v* –2.30 with McKenzie treatment; WMD –0.50, 95% CI –2.72 to +1.72). [45]

Harms:

Heat wrap versus placebo or non-heated wrap:
The review reported that skin pinkness, which resolved quickly, was reported as an adverse effect of heat wrap therapy. [45] The subsequent RCT reported that no serious adverse effects were associated with heat wrap treatment. [46]

Heat wrap versus paracetamol (acetaminophen):
For harms associated with paracetamol, see harms of analgesics, p 7 .

Heat wrap versus NSAID (ibuprofen):
For harms associated with ibuprofen, see harms of NSAIDs, p 4 .

Heat wrap plus education versus education alone:
The subsequent RCT gave no information on adverse effects. [46]

Heat wrap alone versus McKenzie treatment:
The review gave no information on specific adverse effects for this comparison. [45]

Comment: Of the five RCTs identified by the review, one was in people with acute low back pain, and four were in people with subacute low back pain. [45] Four RCTs declared receipt of industry funding.

OPTION TRACTION

We found no clinically important results about the effects of traction in people with acute low back pain.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found four systematic reviews (search dates 1992, [47] 1995, [8] [10] and 2006 [48]). None of the reviews identified any RCTs solely in people with acute low back pain without sciatica.

Harms: Three reviews gave no information on adverse effects. [8] [10] [47] The fourth review reported that increased pain, anxiety during treatment, temporary deterioration, subsequent surgery, and aggravation of neurological signs have been associated with traction. [48] Other adverse effects potentially associated with traction include debilitation, loss of muscle tone, bone demineralisation, and thrombophlebitis. [2]

Comment: Some RCTs included in the earlier systematic reviews did not distinguish between acute and chronic low back pain, included only chronic low back pain, or included people with back pain of specific cause. [8] [10] [47] Of the 25 RCTs identified by the most recent review (2206 people), no studies exclusively involved patients who did not have sciatica, and no studies included only those with acute low back pain. [48]

OPTION TENS

We found no direct information about the effects of TENS in the treatment of people with acute low back pain.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits: We found no systematic reviews or RCTs specifically in people with acute low back pain.

Harms: We found no RCTs.

Comment: None.

OPTION BACK EXERCISES

Symptom improvement
Generic back exercise compared with usual care or no treatment (acute low back pain of less than 6 weeks' duration) We don't know whether exercise is more effective at improving pain (very low-quality evidence).

Generic back exercise compared with non-exercise interventions (acute and subacute low back pain) We don't know whether exercise is more effective at improving pain (low-quality evidence).

Generic back exercise plus CBT compared with no exercise or CBT alone Neuromuscular training plus CBT may be more effective at reducing pain intensity at 7 days (low-quality evidence).

Specific back exercise compared with passive treatments McKenzie treatment may be more effective than a combined analysis of educational booklets, bed rest, ice packs, and massage at reducing pain at 7 days (low-quality evidence).

Specific back exercise compared with advice to stay active McKenzie treatment is no more effective at reducing pain intensity at 12 weeks (moderate-quality evidence).

Specific back exercise compared with flexion exercises We don't know whether McKenzie treatment is more effective at reducing pain at 8 weeks (low-quality evidence).

Specific back exercise compared with back school McKenzie treatment may be more effective at improving pain at 1 year (low-quality evidence).

Functional improvement

Generic back exercise compared with usual care or no treatment (acute and subacute back pain) We don't know whether exercise is more effective at improving function (very low-quality evidence).

Generic back exercise compared with non-exercise interventions (acute and subacute low back pain) We don't know whether exercise is more effective at improving function (low-quality evidence).

Generic back exercise plus CBT compared with no exercise or CBT alone Neuromuscular training plus CBT may be no more effective at improving disability at 12 months (low-quality evidence).

Specific back exercise compared with passive treatments McKenzie treatment may be more effective at 7 days but not at 4 weeks than a combined analysis of educational booklets, bed rest, ice packs, and massage at reducing disability (low-quality evidence).

Specific back exercise compared with advice to stay active McKenzie treatment seems to increase disability at 12 weeks (moderate-quality evidence).

Specific back exercise compared with flexion exercises McKenzie treatment may be more effective at improving disability scores at 5 days (very low-quality evidence).

Specific back exercise compared with spinal manipulation McKenzie treatment may increase disability at 5 days and at 4 weeks (low-quality evidence).

Specific back exercise compared with NSAIDs We don't know whether McKenzie treatment is more effective at 3 months at improving short-term disability (low-quality evidence).

Return to work

Generic back exercise compared with usual care or no treatment (subacute low back pain of 6–12 weeks' duration) We don't know whether exercise is more effective at reducing absenteeism in the work place or at reducing time taken to return to work (very low-quality evidence).

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

We found three systematic reviews [49] [50] [51] and two subsequent RCTs. [52] [53] The first review (search date 2004, 17 RCTs, see comment) included RCTs of back exercises versus placebo, no treatment, or other conservative treatments. [49] The second review (search date 2003, 6 RCTs, 518 people) included RCTs of McKenzie treatment versus passive treatment, advice to stay active, flexion exercises, spinal manipulation, back school, or strengthening. [50] The third review (3 RCTs, number of people included not clear) included RCTs of McKenzie treatment versus the NSAID ketoprofen, massage/advice, or passive movement/mobilisation. [51] The methodological quality of RCTs identified by the first review was assessed by the adequacy of four criteria: randomisation, allocation concealment, follow-up, and outcome blinding. [49] Studies were classed as high-quality if they met all four criteria. The review identified 11 RCTs in people with acute back pain and 6 RCTs in people with subacute back pain; one RCT in each group was categorised as being of high quality. Methodological quality in the second and third reviews were based on the PEDro scale. [50] The second review identified 5 RCTs in people with acute low back pain, 1 RCT in people with subacute low back pain, and 3 RCTs in a mixed population of acute/subacute low back pain; all but one of the identified RCTs were high quality (score of 5+/10). [50] In the third review, two of the three RCTs identified were high quality (5+/10). [51] The first and second reviews identified six RCTs, one of which was also identified by the third review (see comment). The second and third reviews identified three RCTs assessing the effects of McKenzie treatment (see comment). [50] [51] All three reviews defined the included RCTs as either acute (less than 6 weeks' duration), subacute (6–12 weeks' duration), or duration not subgrouped (less than 12 weeks). The first review used both a qualitative rating system and a quantitative pooling of data where possible. [49] The second review pooled data (only statistically homogeneous RCTs) to compare the McKenzie treatment versus passive therapy (combined data on educational booklet, ice packs, massage, and bed rest) and advice to stay active (random effects model). [50] The third review transformed pain and disability scores to a score ranging from 0–100. To describe treatment effect for individual studies, mean and 95% confidence intervals were calculated for between-group differences (see comment). [51] The second review pooled data based on treatments, whereas the third review pooled data based on outcomes, and so, here, we report meta-analyses from only the second review.

Generic back exercise versus usual care or no treatment for acute low back pain (less than 6 weeks' duration):
The first review reported that 10 of 11 RCTs identified had non-exercise comparisons. [49] The review found no significant difference between generic exercise and no treatment in change in pain or function measured at the earliest follow-up (scale 0–100; pain: 3 RCTs, 491 people, WMD –0.59, 95% CI –12.9 to +11.51; function: 3 RCTs, 491 people, WMD –2.82, 95% CI –15.35 to +9.71; see comment). One high-quality RCT in an occupational setting found that mobilising home exercises were less effective than usual care, and one low-quality RCT in a healthcare setting found that a therapist-delivered endurance programme improved short-term functioning more than no treatment. Of the remaining eight RCTs, six studies identified by the review found no statistically significant or clinically important difference between exercise therapy and usual care/no treatment, and the results of two RCTs were unclear. [49]

Generic back exercise versus usual care or no treatment for subacute low back pain (6–12 weeks' duration):
The first review reported that, in six included RCTs, seven exercise groups (total number of exercise groups not reported) had a non-exercise comparison. [49] One high-quality and one low-quality RCT found that a graded exercise intervention reduced absenteeism outcomes in the workplace compared with usual care, and one low-quality RCT found improved functioning with exercise plus behavioural therapy compared with usual care. Two poor-quality RCTs found no difference in outcomes between exercise and the comparative treatments (including usual care), and one poor-quality RCT reported unclear results. One subsequent RCT (134 people with low back pain for at least 4 weeks before inclusion) compared graded exercise versus usual care. [52] The RCT found no significant difference in pain severity (11-point visual analogue scale [VAS]: 0 = no pain to 10 = very severe pain) or functional status (Roland Disability Questionnaire) between graded exercise and usual care, although there were greater improvements in both outcomes with graded exercise (between-group difference at 12 months: pain severity [favours graded exercise]: –0.2, 95% CI –1.2 to +0.8, P = 0.67: functional status [favours graded exercise]: –0.6, 95% CI –2.8 to +1.5, P = 0.56). The RCT found that people assigned to the graded-exercise group returned to work faster than those assigned to usual care (median duration of first continuous period of sick leave after randomisation: 54 days with graded activity *v* 67 days with usual care; significance not assessed). Graded exercise consisted of twice-weekly exercise sessions lasting 60 minutes each until the people either achieved full return to work, or the maximum therapy duration of 3 months had been completed.

Generic back exercise versus non-exercise interventions for acute low back pain (less than 6 weeks' duration):
The review found no significant difference between exercise and other conservative treatments (advice to stay active, education, and usual care) in change in pain or function measured at the earliest follow-up (scale 0–100; pain: 7 RCTs, 606 people, WMD +0.31, 95% CI –0.10 to +0.72; function: 6 RCTs, 534 people, WMD –1.34, 95% CI –5.5 to +2.81). [49] Results were similar at intermediate and long-term follow-up.

Generic back exercise versus non-exercise interventions for subacute low back pain (6–12 weeks' duration):
The first review found no significant difference between exercise and all other comparisons (including no treatment, usual care, advice to stay active, and education) in change in pain or function measured at the earliest follow-up (scale 0–100; pain: 5 RCTs, 608 people, WMD –1.89, 95% CI –4.91 to +1.13; function: 4 RCTs, 579 people, WMD –1.07, 95% CI –5.32 to +3.18). [49] Results were similar at intermediate follow-up. The review concluded that there was insufficient evidence to support or refute the effectiveness of exercise for pain or function in subacute low back pain.

Generic back exercise plus CBT versus no exercise or CBT alone:
We found one RCT (106 men with low back pain during the 3 months before study enrollment) comparing neuromuscular training plus CBT versus no exercise or CBT. [53] At 12 months, the RCT found that neuromuscular training plus CBT significantly decreased pain intensity (VAS) for the 7 days before assessment compared with no treatment (80 people: change in VAS from baseline: from 9.9 to 5.5 with neuromuscular training plus CBT *v* from 11.8 to 10.2 with no treatment; P = 0.032). There was no significant difference between groups in intensity of back pain for the 2 months before assessment, although a greater improvement in pain was reported by the group receiving neuromuscular training plus CBT (80 people: change in VAS from baseline: from 15.3 to 8.6 with neuromuscular training plus CBT *v* from 15.8 to 14.3 with no treatment; P = 0.052). The RCT found no significant difference between treatments in disability (Oswestry Disability Index [ODI]) at 12 months (84 people: change in ODI from baseline: from 5.6 to 4.8 with neuromuscular training plus CBT *v* from 5.8 to 5.0 with no treatment; P = 0.88). Neuromuscular training plus CBT consisted of neuromuscular training plus counselling with cognitive-behavioural goals for improved

lumbar stability (2 sessions/week, one of which was physiotherapist-led and the other independent): the exercise programme consisted of 10 generic exercises.

Specific back exercise (McKenzie treatment) versus usual care or no treatment:
The reviews identified no RCTs for this comparison. [50] [51]

Specific back exercise (McKenzie treatment) versus passive treatments (combined analysis of educational booklets, bed rest, ice packs, and massage):
The second review (4 RCTs, 681 people) found that McKenzie treatment significantly decreased pain and disability at 1 week compared with passive therapy (combined data on educational booklets, bed rest, ice packs, and massage) (2 RCTs, 470 people: pain: WMD –4.16, 95% CI –7.12 to –1.20; disability: WMD –5.22, 95% CI –8.28 to –2.16; absolute numbers not reported; P value not reported). [50] However, there was no significant difference between groups in disability at 4 weeks (3 RCTs, 495 people: WMD –1.06, 95% CI –3.21 to +1.10; absolute numbers not reported; P value not reported).

Specific back exercise (McKenzie treatment) versus advice to stay active:
The second review found a significant increase in disability after 12 weeks' treatment with the McKenzie treatment compared with advice to stay active (2 RCTs, 261 people: WMD [0–100 point scale] 3.85, 95% CI 0.30 to 7.39; absolute numbers not reported; P value not reported). [50] There was no significant difference between groups in pain intensity at 12 weeks (WMD +5.02, 95% CI –1.19 to +11.22; absolute numbers not reported).

Specific back exercise (McKenzie treatment) versus flexion exercises:
The second review did not pool data for this comparison because of clinical and statistical heterogeneity among studies. [50] The review identified two RCTs that met *Clinical Evidence* inclusion criteria. One high-quality RCT (149 people with acute low back pain with or without radiation) identified by the review found no significant difference between treatment groups in pain at 8 weeks (data presented graphically; reported as not significant; P value not reported). [54] One low-quality RCT (24 people) [55] identified by the review [50] found a greater improvement in mean disability scores (ODI) at 5 days' follow-up with McKenzie treatment compared with flexion exercise (data presented graphically in the RCT; no further details reported: mean difference [0 to 100-point scale] between groups reported in the review: –22 points, 95% CI –26 points to –18 points). [50] [55]

Specific back exercise (McKenzie treatment) versus back school:
The second review identified one RCT (100 people with acute or subacute low back pain and with or without radiating pain) that met *Clinical Evidence* inclusion criteria. [50] The RCT found that McKenzie treatment decreased pain at 1 year compared with back school (absolute numbers not reported; P less than 0.001). [56] A 5-year follow-up study of the RCT identified by the review found that McKenzie treatment significantly decreased the proportion of people on sick leave at 5 years compared with back school (24/47 [51%] with McKenzie treatment *v* 31/42 [74%] with back school; P less than 0.03). [57]

Specific back exercise (McKenzie treatment) versus spinal manipulation:
The second review identified one high-quality RCT (24 people with acute or subacute low back pain [58]) that met *Clinical Evidence* inclusion criteria. [50] The RCT did not carry out a statistical analysis. [58] The review found a significant increase in disability (ODI) with McKenzie treatment at 5 days and 4 weeks compared with spinal manipulation (mean difference [0 to 100-point scale]: 5 days: 17 points, 95% CI 8 points to 27 points; 4 weeks; 22 points, 95% 10 points to 33 points). [50]

Specific back exercise (McKenzie treatment) versus NSAIDs:
The third review (1 RCT, 260 people) found no significant difference in short-term disability between McKenzie treatment and the NSAID ketoprofen (follow-up at less than 3 months), although results favoured McKenzie treatment (mean AR –4.2, 95% CI –9.8 to +1.4; absolute numbers not reported). [51]

Harms:

Generic back exercise versus usual care or no treatment for acute low back pain:
The first review reported that few identified RCTs reported on harms (about 26% of RCTs). [49] Overall, in the review (which included RCTs on acute, subacute, and chronic low back pain), 12 RCTs reported mild negative reactions associated with the exercise programme, such as increased low back pain, and soreness in a minority of people; [49] although this is a natural and innocuous reaction, particularly in those starting an exercise programme for the first time or after prolonged inactivity. No further details were provided. The subsequent RCTs gave no information on adverse effects. [52] [35]

Generic back exercise versus usual care or no treatment for subacute low back pain:
See harms of back exercises versus usual care or no treatment for acute low back pain, p 17

Generic back exercise versus non-exercise interventions for acute low back pain:
The review gave no information on adverse effects for this comparison (see harms of back exercises versus usual care or no treatment for acute low back pain, p 17). [49]

Generic back exercise versus non-exercise interventions for subacute low back pain:
The review gave no information on adverse effects for this comparison (see harms of back exercises versus usual care or no treatment for acute low back pain, p 17). [49]

Generic back exercises plus CBT versus no exercise or CBT:
The RCT gave no information on adverse effects. [53]

Specific back exercise (McKenzie treatment) versus usual care or no treatment:
The reviews identified no RCTs for this comparison. [50] [51]

Specific back exercise (McKenzie treatment) versus passive treatments (combined analysis of educational booklets, bed rest, ice packs, and massage):
The review gave no information on adverse effects for this comparison. [50]

Specific back exercise (McKenzie treatment) versus advice to stay active:
The review gave no information on adverse effects for this comparison. [50]

Specific back exercise (McKenzie treatment) versus flexion exercises:
The review gave no information on adverse effects for this comparison. [50]

Specific back exercise (McKenzie treatment) versus back schools:
The review gave no information on adverse effects for this comparison. [50]

Specific back exercise (McKenzie treatment) versus spinal manipulation:
The review gave no information on adverse effects for this comparison. [50]

Specific back exercise (McKenzie treatment) versus NSAIDs:
The review gave no information on adverse effects for this comparison (see review on NSAIDs). [51]

Comment:

There was considerable variation in the exercise programmes undertaken in RCTs identified by the reviews. In the first review, subgroup meta-analysis for different specific types of exercise, or comparisons against specific individual conservative treatments were not reported. [49] The review included RCTs of exercise, this being defined as “a series of specific movements with the aim of training or developing the body by a routine practice or as physical training to promote good physical health”. Individual RCT outcome data for pain and function were converted to a scale from 0 to 100 points to allow the pooling of data. The review considered that a 20-point (out of 100) improvement in pain and a 10-point (out of 100) improvement in functional outcomes were clinically important differences. The review categorised populations of included RCTs as being healthcare (primary, secondary, or tertiary), occupational (occupational healthcare, in compensatory situations), and general or mixed (e.g. people recruited through advertisement for trials), to differentiate those studies in people in typical treatment settings (healthcare, occupational) from those in people who may not normally present for treatment. The review noted that, overall, the methodological quality of included RCTs was poor, with only 54% adequately describing the exercise intervention. The second review concluded that, when evaluating treatment effects of individual RCTs, the McKenzie approach was as effective at all follow-up times as an educational booklet, advice to stay active, and strengthening exercises. Comparisons with flexion exercises and spinal manipulative therapy yielded statistically significant differences favouring McKenzie treatment; however, no placebo-controlled trial was identified. [50] In the first subsequent RCT, it is not clear which component of the complex intervention — the graded activity instruction, the exercises, or the combination of both modalities — is the most important. Because no placebo therapy was used, the attention of the therapist may have had a role in the positive effects. [52] A possible criticism of generic-exercise studies is that all patients in the exercise groups receive the same treatment, regardless of a patient's preference for extension or flexion exercises. According to the McKenzie system, this type of pre-selection is essential to determine a directional preference for certain exercises.

Clinical guide:
For specific exercises, there is a growing, but still limited, evidence for short-term pain reduction and increased function. Given the methodological flaws mentioned above, and the lack of relevant detail of the primary studies, it is not possible to either support or oppose the use of exercise in patients with acute low back pain.

OPTION BED REST

Symptom improvement
Compared with advice to stay active Bed rest is less effective at reducing pain at 3–12 weeks (moderate-quality evidence).

Functional improvement
Compared with advice to stay active Bed rest is less effective at improving functional outcomes at 3–12 weeks (moderate-quality evidence).

Different lengths of bed rest compared Three days and 7 days of bed rest may be equally effective at reducing pain intensity (low-quality evidence).

Return to work
Compared with advice to stay active We don't know whether bed rest is more effective at 12 weeks at reducing sick leave (low-quality evidence).

Adverse effects
Bed rest has been associated with joint stiffness, muscle wasting, loss of bone mineral density, pressure sores, and venous thromboembolism.

For GRADE evaluation of interventions for low back pain (acute), see table, p 26 .

Benefits:

We found one systematic review (search date 2003, 11 RCTs, 1963 people; see comment). [59] The systematic review assessed the methodological quality of included RCTs against standard criteria and categorised them as being of low, moderate, or high risk of bias (see comment). [59]

Bed rest versus advice to stay active:
The systematic review included two RCTs at moderate/low risk of bias in a meta-analysis (see comment). The review found that advice to stay active significantly reduced pain and significantly improved functional status at 3–4 weeks' and 12 weeks' follow-up compared with bed rest (pain: 2 RCTs, 400 people; 3–4 weeks: SMD 0.22, 95% CI 0.02 to 0.41; 12 weeks: SMD 0.25, 95% CI 0.05 to 0.45; functional status: 2 RCTs, 400 people; 3–4 weeks: SMD 0.29, 95% CI 0.09 to 0.49; 12 weeks: SMD 0.24, 95% CI 0.04 to 0.44). [59] The first RCT identified by the review found that advice to stay active significantly reduced sick leave at 3–4 weeks' and 12 weeks' follow-up compared with bed rest (3–4 weeks: WMD 3.4 days, 95% CI 1.64 days to 5.16 days; 12 weeks: WMD 4.5 days, 95% CI 1.37 days to 7.63 days). The second RCT identified by the review found that bed rest increased initial sick leave compared with advice to stay active in people followed up at 12 weeks (86% *v* 52%; P less than 0.001). [59]

Different lengths of bed rest:
One included RCT (47 people) at low risk of bias found no significant difference in pain intensity between 3 days and 7 days of bed rest measured 2 days after the end of treatment. [59]

Bed rest versus exercise:
The review identified two RCTs at low risk of bias. [59] It reported that the first RCT found no significant difference between advice to rest in bed and exercise in pain or restrictions in activities of daily living at 6 weeks, 12 weeks, and 1 year of follow-up. [59] The review reported that the second RCT found no significant difference between advice to rest in bed and exercise in pain, functional status, or sick leave at 3 and 12 weeks' follow-up. [59]

Bed rest versus other treatments:
One included RCT at low risk of bias compared advice to rest in bed versus bed rest plus exercise plus education versus no instruction. The review found no significant difference in pain or restrictions of daily activities between any of the treatment groups (statistical analysis not reported). [59] The review reported that one other included RCT at high risk of bias found no difference in improvement on a combined pain, disability, and physical exam score between bed rest and manipulation, drug therapy, physiotherapy, back school, or placebo (statistical analysis not reported). [59]

Harms:

The review gave no information on adverse effects. [59] One previous systematic review assessing harms [29] found that adverse effects of bed rest included joint stiffness, muscle wasting, loss of bone mineral density, pressure sores, and venous thromboembolism (see review on thromboembolism).

Comment:

The review based classification of bias on four criteria: concealment of allocation, co-interventions, intention-to-treat analysis or losses to follow-up, and blinding of outcome assessor. [59] The review separately analysed: RCTs that included people with acute low back pain, with or without radiating

pain, but excluded people with neurological deficits (called the acute simple low back pain group); RCTs that included people with verified neurological deficits (called the sciatica group); and RCTs that had included people with and without verified neurological deficits (called the mixed low back pain group). [59] We have only reported the results for the acute simple low back pain group here. However, within this group the proportion of people with radiating pain to the legs varied from none in some RCTs to 30% of the study population in others.

Bed rest versus advice to stay active:
In the analysis comparing advice to stay active versus bed rest for pain, one RCT that found significantly better pain outcomes for bed rest compared with advice to stay active was excluded from the meta-analysis: the RCT was categorised as being of high risk of bias, and the applicability of the included population (80 male combat trainees in an army hospital) to the general population was questionable. [59] This RCT also found that bed rest significantly reduced length of sick leave compared with advice to stay active. [59]

GLOSSARY

Acupuncture Needle puncture of the skin at traditional “meridian” acupuncture points. Modern acupuncturists also use non-meridian points and trigger points (tender sites occurring in the most painful areas). The needles may be stimulated manually or electrically. Placebo acupuncture is needling of traditionally unimportant sites or non-stimulation of the needles once placed.
Back school Traditionally, this is a series of group education sessions on low back pain. Sessions are usually supervised by a physiotherapist or physician and often include information on an exercise programme.
Cognitive behavioural therapy This aims to identify and modify people's understanding of their pain and disability using cognitive restructuring techniques (such as imagery and attention diversion) or by modifying maladaptive thoughts, feelings, and beliefs.
Electromyographic biofeedback A person receives external feedback of their own electromyogram (using visual or auditory scales), and uses this to learn how to control the electromyogram and hence the tension within their own muscles. Electromyogram biofeedback for low back pain aims to relax the paraspinal muscles.
Massage Massage is manipulation of soft tissues (i.e. muscle and fascia) using the hands or a mechanical device, to promote circulation and relaxation of muscle spasm or tension. Different types of soft tissue massage include Shiatsu, Swedish, friction, trigger point, or neuromuscular massage.
Multidisciplinary treatment Intensive physical and psychosocial training by a team (e.g. a physician, physiotherapist, psychologist, social worker, and occupational therapist). Training is usually given in groups and does not involve passive physiotherapy.
Sciatica Pain that radiates from the back into the buttock or leg and may also be used to describe pain anywhere along the course of the sciatic nerve.
Cesar therapy Exercise programme to improve posture and so reduce back pain caused by poor posture.
Generic back exercise (low back pain) In this review, generic back exercise denotes undifferentiated exercise/movements performed in multiple directions or planes without emphasis on the person’s pattern of pain or directional preference for pain control.
Low-quality evidence Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate.
McKenzie exercise A method of physiotherapy that involves a comprehensive mechanical diagnosis and treatment to assess the effects on patient symptoms of end-range repetitive movements, static positioning, or both. The mechanical diagnosis enables physiotherapists to prescribe individual exercises in a specific preferred direction. The emphasis is on patient responsibility and self-treatment. Mobilisation techniques are used in more difficult mechanical cases until patients can perform the prescribed exercises on their own.
Moderate-quality evidence Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate.
Very low-quality evidence Any estimate of effect is very uncertain.

SUBSTANTIVE CHANGES

Analgesics (paracetamol, opioids) One RCT added that found no significant difference in pain reduction at 10 days between paracetamol plus tramadol and tramadol alone. [27] However, compared with tramadol alone, the combination treatment was associated with significantly fewer adverse effects. Categorisation unchanged (Unknown effectiveness).
Multidisciplinary treatment programmes One RCT reported in two publications found a small, but significant, worsening in pain intensity at 26 weeks with a multidisciplinary treatment programme compared with usual care. [34] [35] However, there was no significant difference between groups in functional status. At 12 months, the study found no significant difference between a multidisciplinary programme and individual components of the programme and usual care in pain intensity and functional status. Categorisation unchanged (Unknown effectiveness).
Temperature treatments One systematic review added that found that heat wrap significantly improved pain intensity and functional status compared with placebo, and compared with paracetamol (acetaminophen) and ibuprofen. [45] However, the review did not pool data, the RCTs identified were small, and follow-up was short term. Categorisation unchanged (Unknown effectiveness).

Traction One systematic review added; [48] harms section enhanced; categorisation unchanged (Unknown effectiveness). The review identified no RCTs on the effectiveness of traction in people with acute low back pain without sciatica.

Back exercises One review found evidence that McKenzie treatment may be more effective than passive therapies (such as educational booklets, ice packs, and massage) and flexion exercises at improving pain and disability, but less effective than spinal manipulation or advice to stay active. [50] Another review found no significant difference in short-term disability between McKenzie treatment and the NSAID ketoprofen (follow-up at less than 3 months). [51] One RCT added found no significant difference between graded activity and usual care in pain severity and functional status at 12 months. [52] One RCT added found that neuromuscular training plus CBT improved pain intensity for the 7 days before assessment, but not for the 2 months before assessment, compared with CBT alone. [53] The RCT found no significant difference between treatments in functional status. Categorisation changed (from Unlikely to be beneficial to Unknown effectiveness). For specific exercises, there is a growing but still limited amount of evidence for short-term pain reduction and increased function. Given the methodological flaws associated with RCTs and systematic reviews of back exercises, and the lack of relevant detail of the primary studies, it is not possible to either support or oppose the use of exercise in patients with back pain.

NSAIDs Two RCTs comparing NSAIDs against each other added. [22] [23] One RCT found no significant difference between valdecoxib and diclofenac in pain intensity 3 days after initial treatment. [22] The second RCT found a significant improvement in pain intensity after 1–6 days' treatment with lornoxicam compared with diclofenac. [23] However, there was no significant difference between treatments in time to onset of pain relief. Categorisation changed from Beneficial to Trade-off between benefits and harms: use of NSAIDs can be associated with severe adverse effects and evidence is not thought to support favourable treatment effect of NSAIDs for all people with acute low back pain.

Advice to stay active Reassessment of the strength of the evidence led to a recategorisation of this intervention from Beneficial to Likely to be beneficial.

Multidisciplinary treatment programmes (for subacute low back pain) Reassessment of the strength of the evidence led to a recategorisation of this intervention from Likely to be beneficial to Unknown effectiveness.

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TABLE **GRADE evaluation of interventions for low back pain (acute)**

Important outcomes	Symptom improvement, return to work, functional improvement, adverse effects								
Number of studies (participants)	**Outcome**	**Comparison**	**Type of evidence**	**Quality**	**Consistency**	**Directness**	**Effect size**	**GRADE**	**Comment**
What are the effects of oral drug treatments for acute back pain?									
1 (68) [12]	Symptom improvement	Benzodiazepines *v* placebo	4	−3	0	−1	0	Very low	Quality points deducted for sparse data, baseline differences, and incomplete reporting of results, and for poor-quality RCT. Directness point deducted for uncertainty about method of rating improvement
at least 5 RCTs (at least 486 people) [11]	Symptom improvement	Non-benzodiazepines *v* placebo	4	−2	0	0	0	Low	Quality point deducted for incomplete reporting of results and for short follow-up
1 (192) [13]	Functional improvement	Non-benzodiazepines *v* placebo	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
5 (399) [17]	Symptom improvement	NSAIDs *v* muscle relaxants	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
3 (188) [11]	Symptom improvement	Muscle relaxants *v* each other	4	−2	−1	0	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Consistency point deducted for lack of consistent benefit across different outcomes
7 (907) [17]	Symptom improvement	NSAIDs *v* placebo	4	−1	−1	−1	0	Very low	Quality point deducted for incomplete reporting of results. Consistency point deducted for different results for different NSAIDs at different end points. Directness point deducted for inclusion of people with sciatica
23 (2840) [17] [18] [20] [21] [22] [23]	Symptom improvement	NSAIDs *v* each other	4	−1	−1	0	0	Low	Quality point deducted for incomplete reporting of results. Consistency point deducted for conflicting results
1 (104) [20]	Functional improvement	NSAIDs *v* each other	4	−2	0	0	0	Low	Quality point deducted for sparse data and incomplete reporting of results
3 (461) [17]	Symptom improvement	NSAIDs *v* non-drug treatments	4	−1	−1	−1	0	Very low	Quality point deducted for incomplete reporting of results. Consistency point deducted for conflicting results. Directness point deducted for composite outcome
3 (461) [17]	Functional improvement	NSAIDs *v* non-drug treatments	4	−1	−1	−1	0	Very low	Quality point deducted for incomplete reporting of results. Consistency point deducted for conflicting results. Directness point deducted for composite outcome
3 (232) [17]	Symptom improvement	NSAIDs *v* NSAIDs plus adjuvant treatment	4	−1	−1	−1	0	Very low	Quality point deducted for incomplete reporting of results. Consistency point deducted for conflicting results. Directness point deducted for uncertainty about outcomes measured
1 (at least 184 people) [17]	Return to work	NSAIDs *v* NSAIDs plus adjuvant treatment	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
2 (108) [17]	Symptom improvement	Analgesics *v* NSAIDs	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for narrow range of comparators

Important outcomes	Symptom improvement, return to work, functional improvement, adverse effects								
Number of studies (participants)	**Outcome**	**Comparison**	**Type of evidence**	**Quality**	**Consistency**	**Directness**	**Effect size**	**GRADE**	**Comment**
1 (45) [17]	Return to work	Analgesics *v* NSAIDs	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for narrow range of comparators
2 (113) [10]	Symptom improvement	Analgesics *v* non-drug treatments	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for uncertainty about drugs in comparison
1 (119) [27]	Symptom improvement	Combination analgesics *v* analgesics alone	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for narrow range of comparators
What are the effects of local injections for acute back pain?									
No RCTs found									
What are the effects of non-drug treatments for acute back pain?									
at least 1 RCT, and 1 report (at least 457 people) [29] [30] [31]	Return to work	Advice to stay active *v* no advice or traditional medical treatment	4	−1	−1	−1	0	Very low	Quality point deducted for incomplete reporting of results. Consistency point deducted for conflicting results. Directness point deducted for uncertainty about quantification of effect sizes
6 (1957 people) [29]	Functional improvement	Advice to stay active *v* no advice or traditional medical treatment	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for uncertainty about quantification of effect sizes
1(92) [35] [34]	Symptom improvement	Multidisciplinary treatment programme (for acute low back pain) *v* usual care	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for inclusion of co-interventions
1(92) [35] [34]	Functional improvement	Multidisciplinary treatment programme (for acute low back pain) *v* usual care	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for inclusion of co-interventions
1(92) [35] [34]	Return to work	Multidisciplinary treatment programme (for acute low back pain) *v* usual care	4	−2	0	−1	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness point deducted for inclusion of co-interventions
2 (233) [36]	Return to work	Multidisciplinary treatment programmes (for subacute low back pain) *v* usual care	4	−3	0	−1	0	Very low	Quality points deducted for incomplete reporting of results and methodological weaknesses. Directness point deducted for inclusion of co-interventions
at least 1 RCT (at least 192 people) [41]	Symptom improvement	Spinal manipulation *v* placebo/sham treatment	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for inclusion of other interventions
at least 1 RCT (at least 192 people) [41]	Functional improvement	Spinal manipulation *v* placebo/sham treatment	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for inclusion of other interventions

Important outcomes	Symptom improvement, return to work, functional improvement, adverse effects								
Number of studies (participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
3 (200) [41]	Symptom improvement	Acupuncture *v* sham needling or other treatments	4	−3	0	−2	0	Very low	Quality points deducted for incomplete reporting of results and for weak methodologies. Directness points deducted for uncertainty about benefit and for inclusion of other interventions
1 (40) [41]	Functional improvement	Acupuncture *v* sham needling	4	−3	0	−1	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and poor-quality RCT. Directness point deducted for uncertainty about benefit
3 (443) [43]	Symptom improvement	Back schools *v* placebo or usual care	4	−2	0	−2	0	Very low	Quality points deducted for incomplete reporting of results and for inclusion of low-quality RCTs. Directness points deducted for disparities in programmes and populations between the groups affecting generalisability of results
1 (170) [43]	Functional improvement	Back schools plus usual treatment *v* usual treatment alone	4	−2	0	−2	0	Very low	Quality points deducted for sparse data and incomplete reporting of results. Directness points deducted for disparities in programmes and populations between the groups affecting generalisability of results
3 (1362) [43]	Time to return to work	Back schools *v* placebo or usual care	4	−1	0	−2	0	Very low	Quality point deducted for incomplete reporting of results. Directness points deducted for disparities in programmes and populations between the groups affecting generalisability of results
1 (107) [10]	Symptom improvement	CBT *v* usual care	4	−3	0	−1	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and poor-quality RCT. Directness point deducted for uncertainty about scales of measurement
1 (107) [10]	Functional improvement	CBT *v* usual care	4	−3	0	−1	0	Very low	Quality points deducted for sparse data, incomplete reporting of results and for poor-quality RCT. Directness point deducted for uncertainty about scales of measurement
1 (90) [44]	Symptom improvement	Massage *v* spinal manipulation or electrical stimulation	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (90) [44]	Functional improvement	Massage *v* spinal manipulation or electrical stimulation	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
3 (348) [45]	Symptom improvement	Heat wrap *v* placebo or non-heated wrap	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (258) [45]	Functional improvement	Heat wrap *v* placebo or non-heated wrap	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
1 (226) [45]	Symptom improvement	Heat wrap *v* oral analgesic	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for narrow range of comparators
1 (226) [45]	Functional improvement	Heat wrap *v* oral analgesic	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for narrow range of comparators
1 (226) [45]	Symptom improvement	Heat wrap *v* NSAIDs	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for narrow range of comparators

Important outcomes	Symptom improvement, return to work, functional improvement, adverse effects								
Number of studies (participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
1 (226) [45]	Functional improvement	Heat wrap *v* NSAIDs	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for narrow range of comparators
1 (43) [46]	Symptom improvement	Heat wrap plus education *v* education alone	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (43) [46]	Functional improvement	Heat wrap plus education *v* education alone	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (50) [45]	Symptom improvement	Heat wrap alone *v* McKenzie treatment	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (50) [45]	Functional improvement	Heat wrap alone *v* McKenzie treatment	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
10 (at least 491) [49]	Symptom improvement	Generic back exercise *v* usual care or no treatment (acute back pain less than 6 weeks' duration)	4	−2	0	−1	0	Very low	Quality points deducted for incomplete reporting of results, and poor-quality RCTs. Directness point deducted for uncertainty about definition of exercises
10 (at least 491) [49]	Functional improvement	Generic back exercise *v* usual care or no treatment (acute back pain less than 6 weeks' duration)	4	−2	0	−1	0	Very low	Quality points deducted for incomplete reporting of results, and poor quality RCTs. Directness point deducted for uncertainty about definition of exercises
7 (at least 134) [49] [52]	Functional improvement	Generic back exercise *v* usual care or no treatment (subacute low back pain of 6–12 weeks' duration)	4	−2	−1	−1	0	Very low	Quality points deducted for incomplete reporting and for inclusion of poor-quality RCTs. Consistency point deducted for conflicting results. Directness point deducted for uncertainty about definition of exercises
7 (at least 134) [49] [52]	Return to work	Generic back exercise *v* usual care or no treatment (subacute back pain less than 6 weeks' duration)	4	−2	0	−1	0	Very low	Quality points deducted for incomplete reporting and for inclusion of poor-quality RCTs. Directness point deducted for uncertainty about definition of exercises
7 (606) [49]	Symptom improvement	Generic back exercise *v* non-exercise interventions (acute low back pain less than 6 weeks' duration)	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for uncertainty about definition of exercises
7 (534) [49]	Functional improvement	Generic back exercise *v* non-exercise interventions (acute low back pain less than 6 weeks' duration)	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for uncertainty about definition of exercises
5 (608) [49]	Symptom improvement	Generic back exercise *v* non-exercise interventions (subacute low back pain 6–12 weeks' duration)	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness points deducted for uncertainty about definition of exercises
4 (579) [49]	Functional improvement	Generic back exercise *v* non-exercise interventions (subacute low back pain 6–12 weeks' duration)	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness points deducted for uncertainty about definition of exercises
1 (80) [53]	Symptom improvement	Generic back exercise plus CBT *v* no exercise or CBT alone	4	−1	0	−1	0	Low	Quality point deducted for sparse data. Directness points deducted for uncertainty about definition of exercises
1 (84) [53]	Functional improvement	Generic back exercise plus CBT *v* no exercise or CBT alone	4	−1	0	−1	0	Low	Quality point deducted for sparse data. Directness points deducted for uncertainty about definition of exercises

Important outcomes	Symptom improvement, return to work, functional improvement, adverse effects								
Number of studies (participants)	Outcome	Comparison	Type of evidence	Quality	Consistency	Directness	Effect size	GRADE	Comment
2 (470) [50]	Symptom improvement	Specific back exercise *v* passive treatments	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for composite outcome
4 (681) [50]	Functional improvement	Specific back exercise *v* passive treatments	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for composite outcome
2 (261) [50]	Symptom improvement	Specific back exercise *v* advice to stay active	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (261) [50]	Functional improvement	Specific back exercise *v* advice to stay active	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
1 (149) [54]	Symptom improvement	Specific back exercise *v* flexion exercises	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (24) [55]	Functional improvement	Specific back exercise *v* flexion exercises	4	−3	0	0	0	Very low	Quality points deducted for sparse data, incomplete reporting of results, and poor-quality RCT
1 (100) [56]	Symptom improvement	Specific back exercise *v* back school	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (24) [58]	Functional improvement	Specific back exercise *v* spinal manipulation	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results
1 (260) [51]	Functional improvement	Specific back exercise *v* NSAID	4	−1	0	−1	0	Low	Quality point deducted for incomplete reporting of results. Directness point deducted for narrow range of comparators
2 (400) [59]	Symptom improvement	Bed rest *v* advice to stay active	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (400) [59]	Functional status	Bed rest *v* advice to stay active	4	−1	0	0	0	Moderate	Quality point deducted for incomplete reporting of results
2 (400) [59]	Return to work	Bed rest *v* advice to stay active	4	−1	−1	0	0	Low	Quality point deducted for incomplete reporting of results. Consistency point deducted for incomplete reporting of results
1 (47) [59]	Symptom improvement	Different lengths of bed rest compared	4	−2	0	0	0	Low	Quality points deducted for sparse data and incomplete reporting of results

Type of evidence: 4 = RCT; 2 = Observational Consistency: similarity of results across studies
Directness: generalisability of population or outcomes
Effect size: based on relative risk or odds ratio